When nonmanuals meet semantics and syntax: towards a practical guide for the segmentation of sign language discourse

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When nonmanuals meet semantics and syntax: a practical guide for the segmentation of sign language discourse

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Introduction

Previous studies about the segmentation of signed productions (Crasborn, 2007; Fenlon et al., 2007; Hansen & Heßmann, 2007; Herrmann, 2009; Hochgesang, 2009; Jantunen, 2007; Nicodemus, 2006; 2009) take a prosodic perspective to work out how manual and non-manual cues participate in the syntactic organisation of SLs.

Our question: Is there a steady set of cues that can be taken and shared as boundary indicators of discourse segments?

Our goal: Create a set of guidelines for discourse segmentation that can be shared among researchers of different SLs, among different SL corpora and within the same SL corpus.

How? Check if a steady set of criteria can be extracted from the spontaneous segmentation performed by LSFB signers.

Methodology

- 1-hour corpus of 1 signer containing 2 argumentative (A1 & A2), 2 explicative (E1 & E2), 2 metalinguistic (M1 & M2) and 2 narrative (N1 & N2) discourses.
- 3 deaf (2 natives and 1 non-native) and 2 hearing non-native LSFB signers involved in the study as segmenters

- Two-stage process:
  1. **Copy test:** a 3-minute sample of each genre that the 3 deaf had to watch and repeat stopping the clip whenever they wanted to an experimenter who did not see the video and who coded their fragments in ELAN.
  2. **Cut test:** the 1-hour corpus segmented into discourse units using ELAN by both hearing and deaf segmenters according to their intuitions.

Copy test

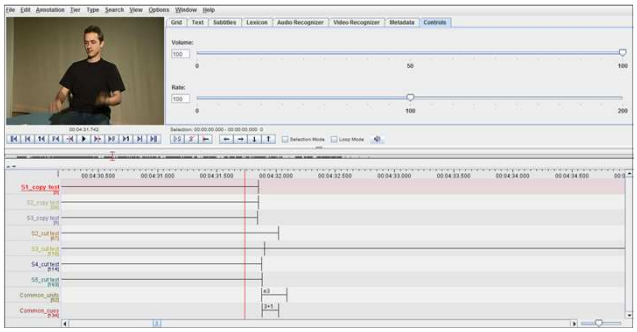
Manual & non-manual cues at discourse units' boundaries spotted by any of the 3 deaf segmenters

Cue	Number of appearances	%
Pause (1)	64	67
Eye blink layered with head nod (3)	38	40
Sign hold (2)	23	24
Change in head position layered with a change in eye gaze (4)	19	20
Eye blink (8)	17	18
Role shift (5)	14	15
Palm-up (9)	11	12
Head nod (10)	5	5
Bracketing repetition (6)	4	4
Head movement (11)	4	4
Change in eyebrow position (13)	3	3
Buoy (14)	3	3
Rhetorical question (7)	2	2
Change in eye gaze (12)	1	1

- Cue 1 and 2: very common and similar in their function.
- Cue 3: the most usual non-manual boundary marker in line with Herrmann (2010).
- Cue 5: commonplace in narratives and indicator of boundaries.
- Cue 9: found in all discourses, even if not so common as a boundary.

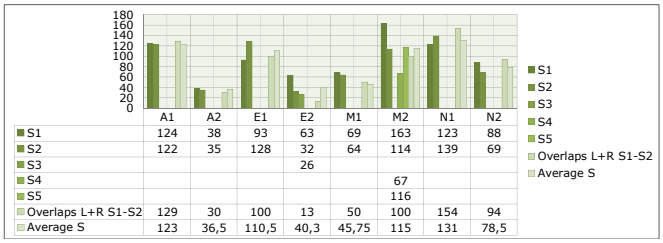
Inter-segmenter agreement and distribution of boundary cues (copy test)

- 3 segmenters (32.63%): 31 boundaries (30 pauses and 1 sign hold).
- 2 segmenters (9.47 %): 9 boundaries (8 pauses and 1 role shift).
- 1 segmenter (57.89%): 55 boundaries but 33 boundaries were also found by at least 2 segmenters in the cut test, i.e. 60%.
- These 33 boundaries include 18 pauses, 12 role shifts and 5 combinations of cues including blinking.



Extract of the annotation scheme in ELAN. One tier per segmenter for each test. Common_units: the common boundaries for the copy test. Common_cues: the cues spotted by at least two segmenters in the cut test.

Inter-segmenter agreement (cut test)



	A1	A2	E1	E2	M1	M2	N1	N2
S1	124	38	93	63	69	163	123	88
S2	122	35	128	32	64	114	139	69
S3				26				
S4						67		
S5						116		
Overlaps L+R S1-S2	129	30	100	13	50	100	154	94
Average S	123	36,5	110,5	40,3	45,75	115	131	78,5

- Different number of segments due to the length of the video and the situation (monologue vs dialogue).
- High agreement between at least 2 segmenters in all videos.

Cut test

Manual & non-manual cues at discourse units' boundaries spotted by at least 2 segmenters

Cue	Number of appearances	%
Pause (1)	304	51.4
Eye blink layered with head nod (3)	266	45
Change in head position layered with a change in eye gaze (4)	187	31.6
Sign hold (2)	142	24
Role shift (5)	137	23.2
Eye blink (8)	81	13.7
Palm-up (9)	77	13
Head movement (11)	43	7.3
Head nod (10)	27	4.6
Change in eyebrow position (13)	21	3.6
Bracketing repetition (6)	18	3
Rhetorical question (7)	17	2.9
Change in eye gaze (12)	13	2.2
Buoy (14)	12	2
Repetition of a sign (AA or AAA) (15)	2	0.3

- Total: 591 segments
- Results are not divergent with the copy test table:
  1. Similar top seven
  2. Similar percentages

Conclusions of both tests

- The same cues influence the segmentation regardless of the instruction given.
- Both tests are highly consistent.

Proposed guidelines for discourse segmentation

I. As a general rule, segment at every pause and at every sign hold.
II. For narrative discourses, segment at the end of every constructed dialogue and role shift.
III. Segment systematically at every eye blink layered with a head nod (or at every combination of a blink in the close context of a change in eye gaze and head position).
IV. Remove all the eye blinks layered with head nods acting as discourse unit linkers.

Eye blinks layered with head nods: caution is needed!

- This cue can either mark a boundary or be a linker within a discourse unit in the middle of temporal syntactic structures or at the end of a parenthetical comment.
- As a non-boundary cue, it is easily isolable:
  1. It is close after a boundary
  2. There is no other associated cue
  3. The chin and the eyebrows go up (ce-up) in the first part of the segment before the eye blink layered with a head nod occurs (only in temporal structures as in the example below).

Even if communication-support workers sign badly, the public think they do a good job.

Open issues

- We want to test these guidelines on a larger LSFB sample containing different discourses and signers.
- We would really appreciate if other SL researchers tested these guidelines with their data on other SLs, so please do it and give us feedback!

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